

## CLAIMS

- 1 1. A method comprising  
2 withdrawing currency from a stack of bills for dispensing  
3 to a customer,  
4 prior to dispensing, detecting a thickness of the withdrawn  
5 currency by pushing a free end of an elongated finger by an  
6 amount that corresponds to the thickness of the withdrawn  
7 currency, and  
8 by electromagnetic coupling determining the amount of by  
9 which the free end is pushed.  
1 2. The method of claim 1 in which the pushing of the free end  
2 is done by passing the currency between the finger and a stationary  
3 element.  
1 3. The method of claim 2 in which the finger is biased to press  
2 the currency against the stationary element.  
1 4. The method of claim 3 in which the currency is driven  
2 across the stationary element after it has been withdrawn from the  
3 stack of bills.  
1 5. The method of claim 4 in which the currency is driven  
2 across the stationary element by passing it through a nip between  
3 two rollers, the nip being spaced above the stationary element.  
1 6. The method of claim 1 in which the pushing of the free end  
2 causes rotation of the finger about an axis.

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- 1 7. The method of claim 6 in which the amount by which the  
2 free end is pushed is determined by relative rotation of two  
3 inductively coupled elements.
- 1 8. Apparatus comprising  
2 a passage through which currency can be driven,  
3 a free end of an elongated finger configured to be moved,  
4 when the currency is driven through the passage, by a distance that  
5 corresponds to a thickness of the currency, and  
6 a pair of inductively coupled elements that are configured  
7 to be moved relative to one another by motion of the elongated  
8 finger to detect the distance that corresponds to the thickness of the  
9 currency.
- 1 9. The apparatus of claim 8 in which the passage comprises a  
2 supporting surface and a space next to the supporting surface.
- 1 10. The apparatus of claim 8 also including a second finger.
- 1 11. The apparatus of claim 8 in which the free ends projects  
2 generally in the direction in which the currency is driven.
- 1 12. The apparatus of claim 8 in which the finger is biased  
2 towards a side of the passage.
- 1 13. The apparatus of claim 8 in which the finger is connected  
2 to one of the inductively coupled elements.
- 1 14. The apparatus of claim 8 in which the elongated finger is  
2 spring loaded to bias the movable element.

1 15. The apparatus of claim 6 in which one of the inductively  
2 coupled elements include paddles connected to the elongated  
3 finger.

1 16. The apparatus of claim 15 in which the other of the  
2 inductively coupled elements is stationary and the paddles are  
3 configured to be movable and generally parallel to the stationary  
4 element.

1 17. A method comprising  
2 withdrawing currency from a stack of bills for dispensing  
3 to a customer,  
4 prior to dispensing, detecting a thickness of the withdrawn  
5 currency by causing relative rotation between two inductively-  
6 coupled elements by an amount that corresponds to the thickness  
7 of the withdrawn currency,

1 18. A double detect mechanism for a cash dispenser  
2 comprising  
3 a passage through which currency can be driven after it is  
4 withdrawn from a money box,  
5 a finger that lies in the passage and is configured to be  
6 moved, when the currency is driven through the passage, through a  
7 distance that corresponds to the thickness of the currency,  
8 a rotational shaft connected to be rotated when the finger is  
9 moved, the rotational shaft bearing paddles, and

10 a circuit board bearing an electromagnetic element that  
 11 cooperates with the paddles to measure the amount of rotation of  
 12 the rotational shaft.

1 19. Apparatus comprising

2 a paper path arranged between an opening in a money box  
 3 through which currency can be withdrawn for dispensing to a  
 4 customer at a dispensing location that is spaced apart from the  
 5 opening in the money box, the paper path including rotational  
 6 shafts arranged to transfer the currency, and

7 a housing that supports the paper path and is configured to  
 8 receive the money box,

9 the housing comprising at least two parallel spaced-apart  
 10 molded side walls,

11 the paper path comprising a molded wall or walls between  
 12 the two parallel molded side walls.

1 20. The apparatus of claim 19 in which the molded side walls  
 2 and the third molded wall comprise separate pieces.

1 21. The apparatus of claim 19 also including a molded top wall  
 2 configured to support electromechanical drive elements, and a  
 3 molded bottom wall.

1 22. The apparatus of claim 19 also including plastic snap-in  
 2 bearings mounted on the parallel side walls and configured to  
 3 support ends of the rotational shafts.

1 23. The apparatus of claim 19 in which the opening in the  
2 money box is at one end of the housing, the dispensing location is  
3 at an opposite end of the housing, and the paper path comprises a  
4 substantially linear path between the opening in the money box and  
5 the dispensing location.

1 24. The apparatus of claim 23 also including a double-detect  
2 mechanism mounted on the paper path at the money box opening,  
3 the double-detect mechanism comprising a rotating element that is  
4 electromagnetically coupled to a detector on a stationary element.

1 25. A currency dispenser comprising

2 a substantially linear paper path arranged between (a) an  
3 opening in a money box through which currency can be withdrawn  
4 and (b) a dispensing location at which the currency can be  
5 dispensed to a customer, the paper path comprising rotational  
6 shafts arranged to transfer the currency,

7 a housing configured to support the paper path to receive  
8 the money box, the housing including two parallel spaced-apart  
9 molded side walls, a third molded side wall between the two  
10 parallel molded side walls, a molded top wall configured to  
11 support electromechanical drive elements, and a molded bottom  
12 wall, the five walls being separate pieces,

13 plastic snap-in bearings mounted on the parallel side walls  
14 and configured to support ends of the rotational shafts, and

15 a double-detect mechanism mounted on the paper path at  
16 the money box opening, the double-detect mechanism comprising

17 a rotating element that is electromagnetically coupled to a detector  
18 on a stationary element.

1 26. A method comprising, not necessarily in the recited order:

2 using fasteners to assemble two parallel side walls and a  
3 paper path wall between the two parallel side walls to form a  
4 housing of a currency dispenser,

5 attaching plastic bearings to the two side walls to mount  
6 currency drive shafts across the paper path wall between the two  
7 side walls, and

8 attaching a double-detect mechanism on the paper path.

1 27. The method of claim 26 also including

2 using fasteners to assemble top and bottom walls as part of  
3 the housing.

1 28. The method of claim 27 in which the fasteners comprise  
2 metal screws.

1 29. The method of claim 27 in which no more than three  
2 fasteners are used to assemble the mating edges of each pair of the  
3 walls.

1 30. Apparatus comprising

2 a molded linear path having a flat supporting surface for  
3 currency being driven from a money box at one end of the path to a  
4 dispensing location at the other end of the path,

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5 a pattern of static electricity grounding elements arranged  
6 along the path, and

7 coupling features configured to enable mounting of the path  
8 between two side walls of a housing of a currency dispenser.

1 31. The apparatus of claim 30 in which the grounding elements  
2 comprise braided wire and metal lugs.

1 32. The apparatus of claim 30 in which the pattern of  
2 grounding elements comprises spacing the grounding elements at  
3 small enough spacing to dissipate static charge.

1 33. The apparatus of claim 30 also including  
2 a double-detect mechanism mounted on the paper path.

1 34. The apparatus of claim 30 also including  
2 curved surfaces at opposite ends of the flat supporting  
3 surfaces, the curved surfaces being configured to direct currency  
4 from the money box onto the linear paper path and from the linear  
5 paper path to the dispensing location.

1 35. A method comprising  
2 determining the presence or absence of a flaw in currency  
3 being dispensed to a customer,

4 routing the currency either to a dispensing location or to a  
5 retention location depending on the detected presence or absence  
6 of the flaw, and

7 causing the currency to be routed by default to the retention  
8 location in the absence of a determination that a flaw is not  
9 present.

1 36. The method of claim 35 in which the flaw comprises a  
2 double bill or a bill that is too thick or too thin.

1 37. The method of claim 36 in which the routing is done by a  
2 movable mechanical element.

1 38. The method of claim 36 in which a series of bills is  
2 dispensed one after another, and the default routing is applied only  
3 to the first bill in the series after which the remaining bills in the  
4 series are routed by default to the dispensing location.